

REMARKS

A marked-up version of the rewritten claims is submitted concurrently herewith in Appendix A under 37 CFR 1.121(c)(1)(ii).

Claims 10, 11, 21 and 28 have been amended. Claims 1-32 remain in the application.

35 U.S.C. 112 Objections and Rejections

Claims 10, 11, 21 and 28 were objected to by the Examiner for informalities. As suggested in the office action, applicant has amended claims 10 and 11 to include “comprising” following the term “further” and has amended claims 21 and 28 to add “consisting” after the word “group”.

Claims 26 was rejected under 35 U.S.C. 112, first paragraph. The Examiner asserted that claim 26 was rejected for:

containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There is no disclosure anywhere in the application of an alloy containing beryllium in an amount of 0.04-0.07 wt%, and this value runs contradictory to applicant's disclosure of beryllium being present in amounts of less than 0.003%.

The applicant stated in the written description that:

[a]pplicant has also found that by decreasing the iron content in common aluminum alloys, such as A356, A357, and A206, and increasing the manganese content to 1.0-2.0% by weight that there is little of no effect on the tensile strength, yield strength, or elongation percentage while ductility and corrosion resistance are increased and susceptibility to die soldering is decreased.

pg. 6, ll. 24-28.

Claim 21 has been amended to eliminate beryllium from the group of substances that can be present at a maximum of 0.2% by weight to eliminate any inconsistencies with claim 26. Claim 26 thus describes a modified form of A357, a die-castable aluminum alloy. A357.0 - T61 and T62 in their standard forms includes iron at a maximum of 0.2 wt%, silicon at 6.5-7.5

wt%, magnesium at 0.4-0.7 wt%, zinc at a maximum of 0.1 wt%, copper at a maximum of 0.2 wt%, titanium at 0.04-0.2%, and beryllium at 0.4-0.7 wt% as required by claim 26. A357.0 -T61 and T62 in their standard forms include manganese at a max of 0.1 wt % whereas claim 26 recites “1.0-2.0% by weight manganese”. The compositions of A357.0-T61 and T62 cited above were obtained from <http://www.matweb.com> and thus would be known to one skilled in the relevant art.

Claims 1-32 were rejected under 35 U.S.C. 112, second paragraph. The Examiner rejected claim 1 because “[t]he term “reduced” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.” Applicants submit concurrently herewith a supplemental IDS including articles establishing the state of the art regarding die soldering of aluminum alloys. A reading of those submitted articles established that one of ordinary skill in the art would be reasonably apprised of the scope of the invention by the usage of the phrase “said alloy characterized by reduced die soldering when used in die casting operations” as recited in claim 1.

The Examiner rejected claim 15 as being indefinite because it recites a ““modified die-castable alloy”, but does not provide any basis for determining what constitutes a modified alloy.” Claim 15 recites:

15. A modified die-castable aluminum alloy which in its unmodified form includes iron in a certain percentage by weight to at least reduce mold soldering and manganese in a lower percentage by weight than the iron comprising:
 - a maximum of 0.6% by weight iron; and
 - manganese in a percent by weight higher than the percentage by weight of iron.

The alloy which is modified is recited to be any aluminum alloy which would include “iron in a certain percentage by weight to at least reduce mold soldering and manganese in a lower percentage by weight than the iron”. Known alloys have a recognized composition. One of ordinary skill in the art would recognize the die-castable aluminum alloys which contain iron in a certain weight percentage to reduce die soldering and also contain manganese in a lower percentage by weight than the iron. Such known alloys might also contain elements or compounds other than aluminum, iron and manganese in a certain range of percentage by

weight. In producing a modified form of a known alloy, the recognized composition would be abided by for all elements and compounds except possibly iron and manganese. Such alloy would be modified by limiting the amount of iron in the alloy to a maximum of 0.6% by weight (which may or may not be different than the weight percent of iron in the unmodified alloy) and by ensuring the weight percent of the manganese is greater than the weight percent iron in the alloy. Claim 15 is definite.

The Examiner rejected claim 32 because of his belief that the term "known aluminum alloy" is indefinite. Those skilled in the art at the time of the invention recognize that aluminum alloys include recognized ranges of components which are standardized and thus would recognize what is meant by the term "known aluminum alloy".

35 U.S.C. 102(b) rejections

It is well settled that in order to establish that a claim is anticipated by an earlier reference that:

TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim." Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

M.P.E.P. Section 2131 (emphasis in original).

Thus, if a cited reference fails to describe all of the elements and limitations of a claim, then rejection of that claim as being anticipated by that reference is improper.

The Examiner rejected claims 1, 15-18 and 32 under 35 U.S.C. 102(b) as being anticipated by Nishi et al. (U.S. Patent No. 4,976,918).

Claim 1 recites:

1. An aluminum based alloy, said alloy comprising:
1.0 - 2.0% by weight manganese;
a maximum of 0.6% by weight iron;
less than 0.003% by weight beryllium;
the remainder being aluminum; and

said alloy characterized by reduced die soldering when used in die casting operations.

Nishi et al. do not anticipate claim 1. Nishi et al. fail to teach or disclose an aluminum based alloy characterized by reduced die soldering when used in die casting operations as required by claim 1.

Claim 15 recites:

15. A modified die-castable aluminum alloy which in its unmodified form includes iron in a certain percentage by weight to at least reduce mold soldering and manganese in a lower percentage by weight than the iron comprising:
a maximum of 0.6% by weight iron; and
manganese in a percent by weight higher than the percentage by weight of iron.

Nishi et al. fail to anticipate claim 15 as they fail to disclose all of the elements and limitations of the claims. Nishi et al. fail to disclose a modified die-castable aluminum alloy which in its unmodified form includes iron in a certain percentage by weight to at least reduce mold soldering and manganese in a lower percentage by weight than the iron as recited in claim 15.

Claim 32 recites:

32. A method of producing components by die casting an aluminum alloy with reduced die soldering, the method comprising the steps of:
providing an aluminum alloy having magnesium, zinc, silicon, copper, beryllium, titanium, nickel, and tin present in percentages by weight consistent with a known aluminum alloy;
maintaining the iron content of the provided alloy at or below the iron content of the known aluminum alloy;
adjusting the manganese content of the alloy to between 1.0-2.0% by weight;
heating the alloy to a temperature conducive to die casting;
casting a component from the alloy; and
removing the cast component from the die.

Nishi et al. fail to anticipate claim 32. Nishi et al. fail to disclose all of the elements and limitations of claim 32. Nishi et al. do not teach or disclose "A method of producing components by die casting an aluminum alloy with reduced die soldering" as required

by claim 32. Nishi et al. do not disclose or teach “maintaining the iron content of the provided alloy at or below the iron content of the known aluminum alloy and adjusting the manganese content of the alloy to between 1.0-2.0% by weight” as recited in claim 32.

35 U.S.C. 103(a) rejections

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). See M.P.E.P. Section 2143 - Section 2143.03 for decisions pertinent to each of these criteria. M.P.E.P. § 2142.

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

The Examiner rejected claims 2-6, 12-14, 19, and 20 under 35 U.S.C. 103 (a) as being unpatentable over Nishi et al. in view of Evans et al. (U.S. Patent No. 5,573,606).

Claim 1, from which claims 2-6 depend, recites an “alloy characterized by reduced die soldering when used in die casting operations”. Neither Nishi et al., nor Evans et al., alone or in combination, teach, disclose or suggest an alloy characterized by reduced die soldering when used in die casting operations as recited in claim 1. Since the combination suggested by the Examiner fails to teach or suggest all of the elements or limitations of claim 1, the Examiner has failed to make a prima facie case of obviousness of dependent claims 2-6. Additionally no suggestion or motivation can be found, either in the references themselves or in

the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings in the manner suggested by the Examiner.

Claim 12 recites:

12. An aluminum based alloy for use in forming a die cast product, said alloy having an elongation value of at least 17%, said alloy comprising

2.5 - 4.0% by weight magnesium;
1.0 - 2.0% by weight manganese;
0.25 - 0.6% by weight iron;
0.2 - 0.45% by weight silicon;
less than 0.003% by weight beryllium;
the remainder being aluminum.

No suggestion or motivation can be found, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings in the manner suggested by the Examiner.

Claim 19 recites:

19. A structural article of manufacture comprising an aluminum alloy having a yield strength of greater than or equal to 11.95 kgf/mm* and an elongation value of greater than or equal to 18%, said aluminum alloy comprising

2.5 - 4.0% by weight magnesium;
1.0 - 2.0% by weight manganese;
a maximum of 0.6% by weight iron;
a maximum of 0.45% by weight silicon;
a maximum of 0.10% by weight copper;
less than 0.003% by weight beryllium;
the remainder being aluminum.

Claim 20 recites "The article of claim 19 wherein the aluminum alloy includes about 1.1% manganese by weight."

No suggestion or motivation can be found, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings in the manner suggested by the Examiner so as to render claims 19 or 20 obvious.

The Examiner rejected claims 7-10 and 28-31 under 35 U.S.C. 103(a) as being unpatentable over Nishi et al. in view of Evans et al. and further in view of Witters et al. (U.S. Patent No. 5,151,136).

Claim 1, from which claims 7-10 depend, recites an “alloy characterized by reduced die soldering when used in die casting operations”. Neither Nishi et al., Evans et al. nor Witters et al., alone or in combination, teach, disclose or suggest an alloy characterized by reduced die soldering when used in die casting operations as recited in claim 1. Since the combination suggested by the Examiner fails to teach or suggest all of the elements or limitations of claim 1, the Examiner has failed to make a prima facie case of obviousness of dependent claims 7-10. Additionally, there is no suggestion, teaching or motivation within Nishi et al., Evans et al. or Witters et al., or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings in the manner suggested by the Examiner.

Claim 28 recites an “alloy characterized by reduced die soldering when used in die casting operations”. Neither Nishi et al., Evans et al. nor Witters et al., alone or in combination, teach, disclose or suggest an alloy characterized by reduced die soldering when used in die casting operations as recited in claim 28. Since the combination suggested by the Examiner fails to teach or suggest all of the elements or limitations of claim 28, the Examiner has failed to make a prima facie case of obviousness of claim 28. Additionally, there is no suggestion, teaching or motivation within Nishi et al., Evans et al. or Witters et al., or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings in the manner suggested by the Examiner.

The Examiner rejected claims 21-24 under 35 U.S.C. 103(a) as being unpatentable over Nishi et al. in view of Evans et al. and further in view of Japanese Patent No. 60050142 A.

Claim 21 recites an “alloy characterized by reduced die soldering when used in die casting operations”. Neither Nishi et al., Evans et al. nor Japanese Patent No. 60050142 A, alone or in combination, teach, disclose or suggest an alloy characterized by reduced die soldering when used in die casting operations as recited in claim 21. Since the combination suggested by the Examiner fails to teach or suggest all of the elements or limitations of claim 21, the Examiner has failed to make a prima facie case of obviousness of claim 21 and dependent claims 22-24. Additionally, there is no suggestion or teaching within Nishi et al., Evans et al. or Japanese Patent No. 60050142 A. to combine the references as suggested by the Examiner.

The Examiner rejected claims 25 and 27 under 35 U.S.C. 103(a) as being unpatentable over Nishi et al. in view of Evans et al. and further in view of Japanese Patent No. 60050142 A and further in view of Witters et al.

Claim 21, from which claims 25 and 27 depend, recites an “alloy characterized by reduced die soldering when used in die casting operations”. Neither Nishi et al., Evans et al., Japanese Patent No. 60050142 A nor Witters et al., alone or in combination, teach, disclose or suggest an alloy characterized by reduced die soldering when used in die casting operations as recited in claim 21. Since the combination suggested by the Examiner fails to teach or suggest all of the elements or limitations of claim 21, the Examiner has failed to make a prima facie case of obviousness of dependent claims 25 and 27. Additionally, there is no suggestion or teaching within Nishi et al., Evans et al. or Witters et al. to combine the references as suggested by the Examiner.

The Commissioner is hereby authorized to charge any additional fees which may be required for this amendment, or credit any overpayment, to Deposit Account No. 10-0435, in reference to 3847-67823.

In the event that an extension of time is required, or may be required in addition to that requested in the petition for extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time, or credit any overpayment for an extension of time, to Deposit Account No. 10-0435, in reference to 3847-67823.

In view of the above, it is submitted that the claims are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance of claims 1-32 at an early date is solicited.

Respectfully submitted,
BARNES & THORNBURG



David B. Quick
Attorney Reg. No. 31,993

DBQ/kim
Indianapolis, IN
(317) 231-7548

APPENDIX A - MARKED-UP VERSION OF THE REWRITTEN CLAIMS

10. The aluminum alloy of claim 8 further comprising 4.2 - 5.0% by weight copper.

11. The aluminum alloy of claim 8 further comprising a maximum of 0.2% by weight copper.

21. A die-castable aluminum alloy comprising:

0.25-0.70% by weight magnesium

1.0 - 2.0% by weight manganese;

a maximum of 0.2% by weight iron;

6.5-7.5% by weight silicon;

a maximum of 0.2% by weight each of additional elements selected from the group consisting of zinc, copper[,] and titanium[and beryllium];

the remainder being aluminum; and

said alloy characterized by reduced die soldering when used in die casting operations.

28. A die-castable aluminum alloy comprising:

0.15-0.35% by weight magnesium

1.0 - 2.0% by weight manganese;

a maximum of 0.1% by weight iron;

4.2-5.0% by weight copper;

a maximum of 0.2% by weight each of additional elements selected from the group consisting of zinc, silicon, nickel, tin, and titanium;

the remainder being aluminum; and

said alloy characterized by reduced die soldering when used in die casting operations.